

SECTION 08550 - WOOD WINDOWS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following aluminum- and vinyl-clad wood-window types:
 - 1. Awning windows.
 - 2. Fixed Windows.

1.3 DEFINITIONS

- A. Performance-grade number, included as part of the window designation system, is the actual design pressure in pounds force per square foot (pascals) used to determine the structural test pressure and water test pressure.
 - 1. Structural test pressure, wind-load test, is equivalent to 150 percent of the design pressure.
 - 2. Water-leakage-resistance test pressure is equivalent to 20 percent of the design pressure with 8 lbf/sq. ft. (383 Pa) as a minimum.

1.4 PERFORMANCE REQUIREMENTS

- A. General: Provide wood windows engineered, fabricated, and installed to withstand normal thermal movement, wind loading, and impact loading without failure, as demonstrated by testing manufacturer's standard window assem-

blies representing types, grades, and sizes required for this Project according to test methods indicated.

- B. Standards: Performance requirements for operating force, air infiltration, water penetration, structural performance, and forced-entry resistance for wood windows are those specified in NWWDA I.S. 2, "Industry Standard for Wood Window Units."
- C. Test Criteria: Testing shall be performed by a qualified independent testing agency based on the following criteria:
 - 1. Design wind velocity at Project site is 90 mph (145 km/h).
 - 2. Heights of window units above grade at the window centerline are indicated or can be determined from the Drawings. Consult with the Owner, if necessary, to confirm required loading and test pressures.
 - 3. Test Procedures: Test window units according to ASTM E 283 for air infiltration, ASTM E 547 for water penetration, and ASTM E 330 for structural performance.
- D. Performance Requirements: Testing shall demonstrate compliance with requirements indicated in NWWDA I.S. 2 for operating force, air infiltration, water penetration, structural performance, and forced-entry resistance for the type and performance grade of window units required. Where required design pressure exceeds the minimum for the specified window grade, comply with requirements of NWWDA I.S. 2, Article 6, "Optional Performance Classifications," for higher than minimum performance grades.
 - 1. Operating Force: The amount of force required to start and to maintain the sash in motion shall not exceed 25 lbf (111 N).
 - 2. Air-Infiltration Rate for Operating Units: Not more than 0.06 cfm/ft. (1.1 cu. m/h per m) of operable sash joint for an inward test pressure of 6.24 lbf/sq. ft. (300 Pa).
 - 3. Water Penetration: No water penetration as defined in the test method at an inward test pressure of 20 percent of the structural test pressure.
 - 4. Structural Performance: No failure or permanent deflection in excess of 0.4 percent of any member's span after removing the imposed load, for a

positive (inward) and negative (outward) test pressure of 30 lbf/sq. ft. (1437 Pa).

5. Thermal Transmittance: Provide window units, labeled and certified according to the National Fenestration Rating Council's Product Certification Program, with the following U-value as determined according to NFRC 100.
 - a. U-Value: 0.60 Btu/sq. ft. x h x deg F (3.4 W/sq. m x K) for operable, double-glazed, metal-clad, wood window units.
 - b. U-Value: 0.58 Btu/sq. ft. x h x deg F (3.3 W/sq. m x K) for fixed, double-glazed, metal-clad, wood window units.
 - c. U-Value: 0.57 Btu/sq. ft. x h x deg F (3.2 W/sq. m x K) for fixed, double-glazed, vinyl-clad, wood window units. (Three thus – verify locations)
 - d. Forced-Entry Resistance: Comply with Performance Level 10 requirements when tested according to ASTM F 588.

1.5 SUBMITTALS

- A. Product Data: For each type of wood window required. Include the following:
 1. Construction details and fabrication methods.
 2. Profiles and dimensions of individual components.
 3. Data on hardware, accessories, and finishes.
 4. Recommendations for maintenance and cleaning of exterior surfaces.
- B. Shop Drawings: For each type of window required. Include information not fully detailed in manufacturer's standard Product Data and the following:
 1. Layout and installation details, including anchors.
 2. Elevations at 1/4 inch = 1 foot (1:50) scale and typical window unit elevations at 3/4 inch = 1 foot (1:20) scale.
 3. Full-size section details of typical composite members, including reinforcement and stiffeners.
 4. Hardware, including operators.

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- 5. Glazing details.
 - 6. Accessories.
- C. Samples for Initial Selection: One 12-inch- (300-mm-) long section of window members. Where finishes involve normal color variations, include Sample sets showing the full range of variations expected.
- D. Samples for Verification: The Government reserves the right to require additional Samples that show fabrication techniques, workmanship, and design of hardware and accessories.
- E. Test Reports: From a qualified independent testing agency indicating that each type, grade, and size of window unit complies with performance requirements indicated based on comprehensive testing within the last five years of current window units. Test results based on use of downsized test units will not be accepted.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Firms whose windows have been certified under NWWDA's "Hallmark Program" for wood window units are listed in the current NWWDA "Membership and Product Directory" and comply with requirements indicated.
- 1. Provide only wood window units bearing an NWWDA "Hallmark Program" label certifying compliance with NWWDA I.S. 2.
- B. Testing Agency Qualifications: To qualify for approval, an independent testing agency must demonstrate to Government's satisfaction, based on evaluation of agency-submitted criteria, that it has the experience and capability to conduct the testing indicated without delaying the Work.
- C. Source Limitations: Obtain each type of wood window units through one source from a single manufacturer.
- D. Product Options: Drawings indicate size, profiles, dimensional requirements, and aesthetic effects of wood windows and are based on the specific window

types and models indicated. Other manufacturers' products with equal performance characteristics may be considered provided deviations in size, profile, and dimensions are minor and do not alter the aesthetic effect. Refer to Division 1 Section "Substitutions."

- E. Safety Glass Standard: Provide products complying with testing requirements of 16 CFR, Part 1201 for Category II materials.
 - 1. Subject to compliance with requirements, provide safety glass permanently marked with the certification label of the Safety Glazing Certification Council or another certification agency acceptable to authorities having jurisdiction.
- F. Glazing Standards: Comply with recommendations of GANA's "Glazing Manual" and "Sealant Manual," unless more stringent requirements are indicated.
- G. Insulating-Glass Certification Program: Provide insulating-glass units permanently marked on spacers or at least on one component pane of units with the appropriate certification label of the inspecting agency indicated below:
 - 1. Insulating Glass Certification Council.
 - 2. Associated Laboratories, Inc.
 - 3. National Certification Testing Laboratories.

1.7 PROJECT CONDITIONS

- A. Field Measurements: Verify window openings by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.8 WARRANTY

- A. General Warranty: The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

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- B. Special Warranty: Submit a written warranty, executed by wood window manufacturer, agreeing to repair or replace window components that fail in materials or workmanship within the specified warranty period. Failures include, but are not limited to, the following:
1. Structural failures, including excessive deflection, water leakage, air infiltration, or condensation.
 2. Faulty operation of sash and hardware.
 3. Deterioration of finishes and other materials beyond normal weathering.
 4. Deterioration of insulating Glass.
- C. Warranty Period : Ten years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering window units that may be incorporated into the Work include, but are not limited to:
1. Aluminum-Clad Wood Window Units:
 - a. Marvin Windows.
 - b. Pella Corporation.
 - c. Pozzi Wood Windows.
 - d. Weather Shield Mfg., Inc.
 2. Vinyl-Clad Wood Window Units:
 - a. Anderson Windows

2.2 MATERIALS

- A. General: Comply with NWWDA I.S. 2.

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- B. Wood: Clear pine or other suitable fine-grain lumber, kiln dried to a moisture content of 6 to 12 percent at time of fabrication. Free of visible finger joints, blue stain, knots, pitch pockets, and surface checks larger than **1/32 inch (1 mm)** wide by **2 inches (50 mm)** long.
1. Lumber shall be water-repellent preservative treated after machining per NWWDA I.S. 4.
- C. Aluminum Cladding: Manufacturer's standard aluminum formed sheet or extruded cladding mechanically bonded to exterior wood sash and frame members.
1. Trim Members: Provide aluminum-clad wood, hollow-aluminum extrusions, or roll-formed aluminum trim members.
 2. Finish: Factory-applied, baked-on enamel finish.
 - a. Color: Custom color to match P302, Ivy by Pozzi Wood Windows.
- D. Vinyl Cladding: Manufacturer's standard vinyl cladding, consisting of a rigid PVC sheath, complying with ASTM D 1784, Class 14344-C, not less than **35-mil (1-mm)** average thickness, in permanent color, as selected, mechanically bonded to exterior wood sash and frame members.
1. Trim Members: Vinyl-clad wood or hollow-vinyl extrusions.
 2. Color: Match existing.
- E. Anchors, Clips, and Accessories: Fabricate anchors, clips, and window accessories of aluminum, nonmagnetic stainless steel, or hot-dip zinc-coated steel or iron complying with requirements of ASTM B 633 for SC 3 (severe) service condition; provide sufficient strength to withstand design pressure indicated.
- F. Fasteners: Comply with NWWDA I.S. 2 for fabrication and with manufacturer's recommendations and standard industry practices for type and size of installation fasteners.
1. Use zinc-coated or nonferrous nails and screws for window fabrication and installation.
 2. Use brass screws for hardware and accessory installation.

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- G. Compression-Type Weather Stripping: Provide compressible weather stripping designed for permanently resilient sealing under bumper or wiper action, and completely concealed when sash is closed.
 - 1. Weather-Stripping Material: Molded, expanded, EPDM, neoprene, or other flexible gaskets complying with ASTM C 509, Grade 4.
 - H. Wire-Fabric Insect Screen: 18-by-14 (1.2-by-1.6-mm) or 18-by-16 (1.2-by-1.4-mm) mesh of 0.013-inch- (0.3-mm-) diameter, coated aluminum wire, complying with FS RR-W-365, Type VII.
 - I. Glass and Glazing Materials: Provide manufacturer's standard clear, sealed, insulating glazing material that complies with Division 8 Section "Glazing."
 - 1. Dual-Glazing System: Provide manufacturer's standard dual-glazing system with two lites of clear float glass, complying with ASTM C 1036, Type I, Quality q3, glazed independently into the sash and separated by a minimum dead-air space of 1-1/2 inches (38 mm).
 - J. Glazing Seal: Provide manufacturer's standard extruded, vinyl, or butyl glazing gasket providing weathertight seal.

2.3 HARDWARE

- A. General: Provide manufacturer's standard hardware, necessary to operate, tightly close, and securely lock windows. Provide removable hardware for staff use only. Do not use aluminum in frictional contact with other metals.
- B. Four-Bar Friction Hinges: Comply with AAMA 904.1.
 - 1. Friction Shoes: Nylon or other nonabrasive, nonstaining, non-corrosive, durable material.
- C. Gear-Type Rotary Operators: Comply with AAMA 901.1 for rotary operators. Comply with ASTM E 405, Method A, when subjected to operating moments and closing torques indicated in AAMA 101.

1. Operator shall operate all ventilators simultaneously, securely closing them at both jambs without using additional manually controlled locking devices.
- D. Limit Device: Manufacturer's standard, concealed friction adjustor, adjustable stay bar, limit device designed to restrict ventilator opening.

2.4 ACCESSORIES

- A. Insect Screens: Provide insect screens for each operable exterior sash or ventilator. Locate screens on inside or outside of window sash or ventilator, depending on window type. Design windows and hardware to accommodate screens in a tight-fitting, removable arrangement, with a minimum of exposed fasteners and latches. (Charcoal Aluminum wire)
 1. Screen Frames: Fabricate frames of tubular-shaped, extruded- or formed-aluminum members of **0.040-inch- (1-mm-)** minimum wall thickness, with mitered or coped joints and concealed mechanical fasteners. Provide removable PVC spline/anchor concealing edge of screen frame. Comply with SMA 1004.
 - a. Finish: Match window members.
- B. Grilles (False Muntins): Provide grilles in designs shown, for removable application to inside of each sash light.
 1. Material: Pre-finished wood.
 2. Design: Rectangular with eased edges.
 3. Color facing interior : match window interior color.
 4. Color facing exterior: match window exterior color.

2.5 AWNING WINDOWS

- A. Window Grade: Comply with requirements of NWWDA Performance Grade DP15.
- B. Hardware: Provide the following equipment and operating hardware:
 1. Operating Device: Rotary operator located on jamb at sill.

2. Hinges: Concealed four-bar friction hinges (two per ventilator) located on each jamb near top rail.
3. Limit Device: Manufacturer's standard limit device (two per ventilator) located on each jamb.
4. Cam latch or other latching hardware with lever handle or pull.
 - a. Provide latch with eye for pole operation for operable sash located more than 72 inches (1800 mm) above floor. Provide removable hardware.

2.6 FIXED WINDOWS

- A. Window Grade: Comply with requirements of NWWDA Performance Grade DP15.

2.7 FABRICATION

- A. General: Fabricate wood window units to comply with indicated standards. Include a complete system for assembly of components and anchorage of window units.
 1. Comply with requirements of NWWDA I.S. 2 for moisture content of lumber at time of fabrication.
- B. Fabricate windows to produce units that are reglazable without dismantling sash framing. Provide openings and mortises precut, where possible, to receive hardware and other items.
 1. Provide weather stripping at perimeter of each operating sash.
 2. Provide removable insect screen for each operating sash, with location determined by manufacturer.
- C. Complete fabrication, assembly, finishing, hardware application, and other work before shipment to the Project site, to the maximum extent possible. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

2.8 FINISHES

- A. Wood Finish: Provide the following finish on exposed wood in units:
 - 1. Shop-Finished Units: Provide manufacturer's standard shop finish, consisting of prime coat and two finish coats, 3-mil (0.08-mm) dry film thickness, applied to interior wood surfaces.
 - a. Color: Clear

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine openings before installation. Verify that opening is correct and sill plate is level. Proceed with installation only after unsatisfactory conditions have been corrected.
 - 1. Masonry surfaces shall be dry and free of construction debris.
 - 2. Wood frame walls shall be dry, clean, sound, well-nailed, free of voids, and without offsets at joints. Ensure that nail heads are driven flush with surfaces in opening and within 3 inches (75 mm) of corner.
 - 3. Coordinate window installation with wall flashing and other built-in components.

3.2 INSTALLATION

- A. Comply with manufacturer's written instructions and recommendations for installing window units, hardware, operators, accessories, and other components of the Work.
- B. Set window units level, plumb, true to line, without warp or rack of frames or sash. Provide proper support and anchor securely in place.
- C. Set sill members in a bed of sealant or with joint fillers or gaskets, as indicated, to provide weathertight construction.

3.3 ADJUSTING

- A. Adjust operating sash and hardware to provide a tight fit at contact points and weather stripping for smooth operation and a weathertight closure. Lubricate hardware and moving parts.

3.4 CLEANING

- A. Clean interior and exterior surfaces immediately after installation. Exercise care to avoid damage to protective coatings and finishes. Remove excess glazing and sealants, dirt, and other substances.
- B. Clean glass of factory-glazed units immediately after installing windows. Wash and polish glass on both faces before Substantial Completion. Comply with manufacturer's recommendations for final cleaning and maintenance. Remove nonpermanent labels from glass surfaces.
- C. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during the construction period.

3.5 PROTECTION

- A. Protect window units from damage or deterioration until the time of Substantial Completion.

END OF SECTION 08550